

## BUBBLE SORT ALGORITHM CLASSWORK

The “bubble sort” algorithm goes through a list of numbers, and interchanges two adjacent numbers in the list if they are in the wrong order. Below is an illustration of the algorithm for a list that contains six numbers. While, in this example, the list is sorted after Pass 3, in general, for a list of  $n$  numbers,  $n - 1$  passes are required.

Pass 0	Pass 1	Pass 2	Pass 3	Pass 4
-----	-----	-----	-----	-----
2	2	2 0	0 0	0 0
5 4	4 0	0 2	2 2 1 1	1
4 5 0	0 4 3	3 1 1	2 2 2	
0 5 3	3 4 1 1	3 3 3	3 3 3	
3 5 1 1	4 4 4 4	4 4 4	4 4 4	
1 5 5	5 5 5	5 5 5	5 5 5	

On the next page is the listing of the file `BubbleSortStub.java`. The method `sort ()` performs the bubble sort algorithm outlined above.

## BUBBLE SORT ALGORITHM CLASSWORK

```

public class BubbleSort {
    /**/
    private int [] list;
    /**/
    public static void main ( String [] arg ) {
        /**/
        BubbleSort bs;
        /**/
        if ( arg.length != 2 ) {
            System.out.println();
            System.out.println("Usage:");
            System.out.println("java BubbleSort inputFile outputFile");
            return;
        }
        /**/
        bs=new BubbleSort(arg[0]);
        bs.sort();
        bs.printList(arg[1]);
        /**/
        return;
    }
    /**/
    public BubbleSort ( String inputFile ) {
        /**/
        initList(inputFile);
    }
    /**/
    public void sort () {
        /**/
        int len, temp;
        /**/
        len=list.length;
        for ( int p=0; p<len-1; ++p ) {
            for ( int i=0; i<len-p-1; ++i ) {
                if ( list[i+1] < list[i] ) {
                    temp=list[i+1];
                    list[i+1]=list[i];
                    list[i]=temp;
                }
            }
        }
        /**/
        return;
    }
    /**/
    public void printList ( String outputFile ) {
        /**/
        *   Add code here which prints the list to the file "outputFile".
        *   Print the list using the format specifier "%4d".
        */
    }
    /**/
    private void initList ( String inputFile ) {
        /**/
        *   Add code here which initializes the private field "list"
        *   by reading in the list from file "inputFile"
        */
    }
}

```

## BUBBLE SORT ALGORITHM CLASSWORK

- 1) Add the needed code to methods `initList` and `printList` as per the comments in `BubbleSortSub.java` to make a program `BubbleSort.java`.
- 2) Test your program with the input file `s_10000.txt`, the first few lines of which are listed below. Note that the first line of the file is the length of the list, *i.e.*, 10,000. Note that the list contains all of the numbers between 0 and 9999 (inclusive) listed in random order.

```
10000
/**/
1055
294
593
.
.
.
```

The first few lines of your output file should look like

```
10000
/**/
0
1
2
.
.
.
```